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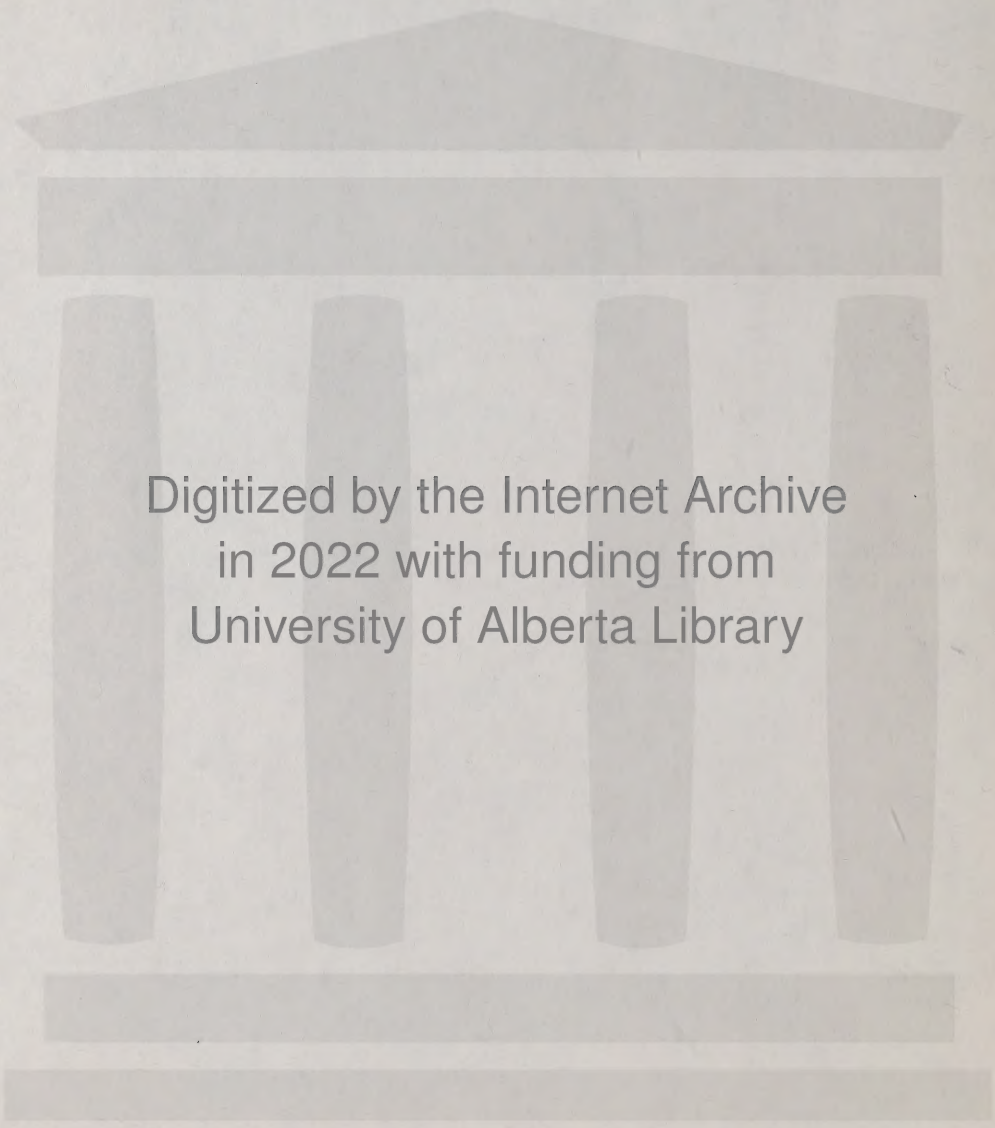

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Muskox exploitation: hunter and gatherer subsistence models re-examined

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INTRODUCTION

Archaeological faunal analysis is playing a central role in many types of studies dealing with explanation of past human behavior. Recent research directions have been on understanding the relationship between the patterning observed in bone assemblages and the human activities responsible for their accumulation. Towards this goal, an increasing emphasis has been placed on controlled experimention to develop analogs for activities, such as butchering practices (Bonnichsen 1973). Other research endeavors, including ethnoarchaeology or living archaeology have been directed at documenting how contemporary hunters and gatherers subsist on non-domesticated foods (Binford 1978; Gould 1980 and Yellen 1977).

These types of studies provide a wealth of information concerning the cultural diversity among hunters and gatherers in the procurement, butchering, sharing and ultimate discard of animal remains. There are, however, some basic assumptions incorporated into models of hunter and gatherer subsistence behavior which require further consideration and testing where

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possible.

One assumption frequently labelled *environmental determinism* concerns the implicitly perceived unilinear relationship between people and their environment. A corollary to this assumption is that hunter and gatherer economics can be reduced to a set of critical decisions concerning the aquisition of food resources. An additional notion is that food procurement activity is the central theme of hunter and gatherer existence, and that other human behaviors are necessarily secondary to it. Although this type of arguement is presented in a somewhat simplistic fashion, various forms of it are found in the contemporary literature. For example, hunter and gatherer optimal diet models are aimed at precise reconstructions of past environments in order to estimate resource availability. The results are then used to predict prehistoric settlement patterns (for example, see Jochim 1976 and Perlman 1976).

In conjunction with this first type of assumption is another with equal importance about how prehistoric hunter and gatherer behavior is investigated. It involves the ethnocentric notion that "primitive" people were not capable of understanding and utilizing ecological principles.

Only recently has it been recognized , as well as, documented that hunters and gatherers have some comprehension of the dynamic interaction of various ecosystem components and

successfully manipulate them for their own advantage. For example, Lewis' (1977) fire ecology research demonstrates that North American Indians recognized the relationship between burning and forest productivity. They employed fire to their benefit in creating preferred habitats for food species, such as moose and waterfowl.

Although it may be difficult to document, the prehistoric management of wildlife resources must also be considered as a possibility. The term *management* is used loosely here in the sense of manipulating a resource for one's own security. It is different from concepts like optimization or maximization in that controlled aquisition, and frequently deferred use of the resource are implied.

Animal resources are usually thought of by archaeologists in the same manner as lithic resources. They are quarried from specified localities in the physical environment and returned to the community for use. After the resource is consumed, trips are undertaken to renew meat supplies. At some time, resource availability diminishes or is completely eliminated and people simply shift their activities to a new quarry (prey).

This type of over-simiplified model contains two unacceptable assumptions: 1) that animals do not respond to predation from either humans or other animals, and 2) that hunter-gatherers were unaware of animal ecology and did not in

certain situations practice any kind of animal management. Quite obviously, predator and prey do interact. More realistic models of hunter and prey interaction could be formulated by exploiting the wealth of animal behavior data present in wildlife literature.

The 19th Century Banks Island archaeological record provides an opportunity for examining more closely some of the asumptions raised in the above discussion, as well as the perspectives and means by which faunal analysts interpret bone refuse assemblages. What makes the Banks Island situation particularly attractive is the fact that people moved onto the island for a very limited time period (approximately 35-40 years) and exploited a food resource not regularly utilized to any significant degree elsewhere prehistorically.

COPPER INUIT ON BANKS ISLAND

The reason for the 19th Century occupation of the Island by Copper Inuit was to acquire a previously unavailable, non-food resource. Shortly after the abandonment of the H.M.S. Investigator in Mercy Bay in 1853, Victoria Island Copper Inuit became aware of its location and cache. The valuable resources (especially metal and wood) left behind by the Investigator crew enabled the Prince Albert Sound and Minto Inlet Copper Inuit to perpetuate or initiate an important role in trade relations with other Copper Inuit groups (Hickey pers. comm.).

The kinds of interior food species available on northern Banks Island were not unfamiliar to the Copper Inuit, although their distribution as well as availability in terms of abundance may have been quite different from the Victoria Island homeland. However, there were probably not many differences between the kinds of marine resources which were available on either side of Prince of Wales Strait. Even polar bears were taken around Prince Albert Sound, Minto Inlet and the southern end of Banks Island , enthographically. (Jenness 1922:101 and Stefansson 1913:289,522).

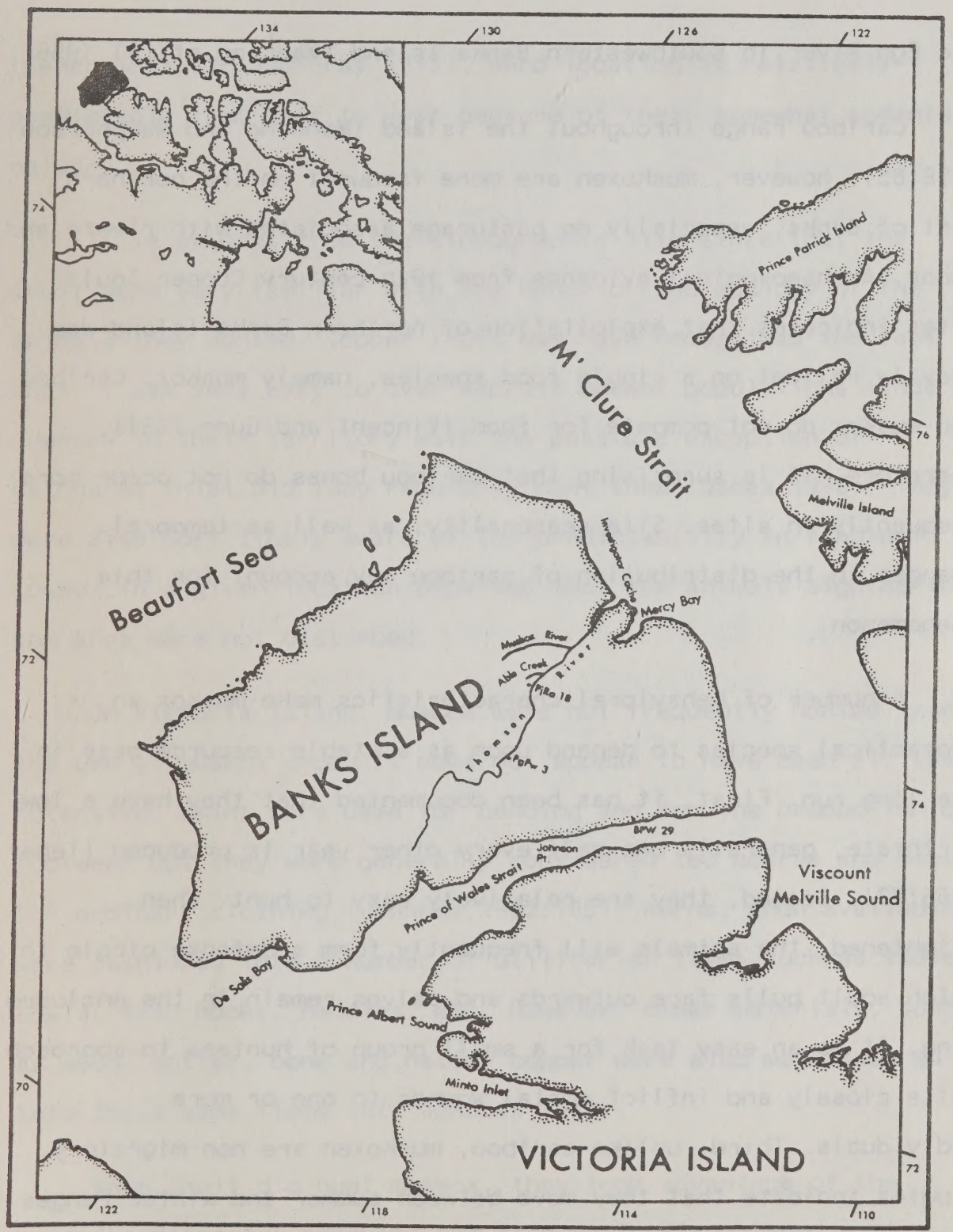
What is interesting to record here is that around 1895, the Inuit removed themselves from Banks Island. Stefansson (1913:288) records the virtual abandonment of Banks Island due to starvation: an explanation provided to him by Prince Albert Sound Inuit. Other writers have drawn similar conclusions based on the presumed extinction of Banks Island muskoxen caused by the Inuit around the turn of the century. Indeed, wildlife census data indicate that the muskox population on Banks was very small until a relatively rapid increase occurred in the 1960's. No muskox sightings on Banks Island are recorded in the literature between 1911 and 1949 (Harrington 1963). However, Stefansson (1913) believed that a few animals might have survived at the northern end of the island. Macpherson (1960:9) estimated a population of about 1000 animals on Banks Island in 1959. Thirteen years later, a population of 3,800 animals was estimated (Urquhart 1973) and a current estimate of of 18,328 muskoxen on Banks Island is

suggested by Vincent and Gunn (1981). However, this figure is considered too high by some researchers.

Evidence for the 19th century occupation of Banks Island is derived primarily from survey reports of work initiated in the 1970's (Hickey 1978 and Wilkinson and Shank 1974). These reports indicate that the geographical distribution of 19th Century Copper Inuit sites is largely confined to an area north of De Salis Bay and as far west as the Thomsen River and its tributaries. Sites are concentrated along the Thomsen River and its tributaries. This river provides a good interior route from the east coast of Banks Island to Mercy Bay (Fig. 1).

The physical environment of interior northeastern Banks Island has probably undergone little change since the early post-glacial period. In general, it is characterized by post-glacial and permafrost landforms dissected by permanent and perennial rivers and streams. Lakes and ponds are most extensive in this part of the island. Extreme aridity means that areas of relatively abundant vegetation are usually restricted to river valleys and lake and pond situations. Principal mammal species which would have had economic significance to native peoples include muskox and caribou. Arctic fox and hare are also present, and birds and fish are abundant. However, potentially important avafauna, such as Snow goose, seem to be most common in areas further south. The largest nesting colony today is located along

Fig. 1 Banks Island and location of place names mentioned in text



the Egg River in southwestern Banks Island (Manning et. al 1956).

Caribou range throughout the island (Manning and Macpherson 1958:65), however, muskoxen are more frequent on the northern part of Banks, especially on pasturage associated with rivers and ponds. Archaeological evidence from 19th century Copper Inuit sites indicates that exploitation of northern Banks Island was heavily reliant on a single food species, namely muskox. Caribou and muskox do not compete for food (Vincent and Gunn 1981). Therefore, it is surprising that caribou bones do not occur more frequently in sites. Site seasonality, as well as temporal changes in the distribution of caribou may account for this phenomenon.

A number of behavioral characteristics make muskox an impractical species to depend upon as a stable resource base in the long run. First, it has been documented that they have a low birthrate, generally one calf every other year is produced (Tener 1965:77). Second, they are relatively easy to hunt. When frightened, the animals will frequently form a defense circle in which adult bulls face outwards and calves remain in the enclosed ring. It is an easy task for a small group of hunters to approach quite closely and inflict mortal wounds to one or more individuals. Third, unlike caribou, muskoxen are non-migratory. Studies indicate that they move between summer and winter ranges depending on environmental conditions and population density

(Tener 1965:93, and Gray 1973). Herd location is relatively predictable from year to year because of their somewhat sedentary nature.

It is evident from the ethnographic literature that the Inuit were very familiar with the behavior and ecology of the animals they hunted. Copper Inuit may have recognized the fact that it was very easy to over-exploit muskox populations since nowhere in their territory with the possible exception of Bathhurst Inlet did they regularly hunt them (Damas 1972). They were also most likely aware of the predictability in finding muskox in a given location provided that the animals sighted in the area were not disturbed.

On Victoria Island, muskox were not frequently hunted, and the use of muskox products does not appear to have been all that intensive. Skins were used for bedding and for the production of footwear but they were generally considered too coarse and heavy for ordinary clothing (Jenness 1922:105). Horns, when available, were fashioned into a number of utilitarian items such as ladles, bowls, fish-hooks, handles, etc. However, other materials, such as wood, antler, bone and native copper were also manufactured into these same items (cf. Jenness 1946).

When Inuit did hunt muskox, they took advantage of the animal's defensive behavior and frequently slaughtered entire herds. Another muskox behavioral trait, fleeing to high ground

when frigtened (Tener 1965:104), enabled the Inuit to drive animals right up onto the camp area where additional hunters waited to ambush them. For example, Jenness (1922:150) states that: "The natives say that these animals [muskoxen], unlike deer, will not flee at the sight of a human being, and in consequence are often driven right up to the camp before being dispatched."

In order to journey from the east Banks coast north across the island to Mercy Bay it would have been necessary to have a dependable resource base. Muskoxen probably provided the only interior food resource of any quantity . However, because it was easily hunted, and because one usual method of procurement involved slaughtering entire herds, it was also easy to exterminate. In order to make it a dependable food resource for the duration of occupation on Banks Island, Copper Inuit may have practiced some sort of resource management.

One possible strategy may have been for small groups of Prince Albert Sound and Minto Inlet Inuit to visit Banks Island with the specific purpose of getting to Mercy Bay as quickly as possible, and after collecting exotic materials returning to the Victoria homeland. Inuit people initially coming to Banks Island had to employ animal exploitation strategies which did not eliminate the resource base before the Investigator goods were first exhausted themselves. The timing of access to reach Mercy

Bay may have been more important than when to hunt muskox simply because the species is not migratory. Unlike other animals, such as caribou, muskox could be harvested during any season with about the same probability of success. Therefore, a primary factor in locating campsites would have been access to the north coast. This may have required caching food provisions in advance of occupation at a later time in the year. Camps might also be located on high ground over-looking muskox pasturage onto which herds of muskoxen could be driven and slaughtered.

The Copper Inuit exploitation of Banks Island would have required changes in subsistence and settlement activities as practiced in the Victoria Island homeland. Changes in subsistence behavior were necessary because of the sensitive nature of the food resource base (muskox) and also to take advantage of the much valued European goods in Mercy Bay. The strategy required depending on a food resource base recognized as unsuitable over long time periods, and the intensification of long range food storage practices.

Archaeologically, the hypotheses mentioned in the above are being tested with information collected from site survey on the interior of northern Banks Island, as well as the central and northeast coast. In addition to inter-site analysis, intra-site studies of specific sites are underway using data collection methods and computer techniques described earlier in this

symposium. One site, located on the northeast coast, for which some analysis of the faunal data has already been completed is BPW-29.

An almost complete site record has been obtained from this Copper Inuit occupation. It covers approximately 2,600 square meters, of which 2,300 square meters (88%) were mapped during a ten day period in 1981. Approximately 10,000 faunal specimens have been data banked. Muskox bones predominate in the osteological collection as indicated by the 8,517 items. Calcomp plots of muskox faunal material provide initial support for Copper Inuit hunting strategies noted earlier. For example, the presence of many articulated muskox vertebra at the southern site end suggest that a herd or herds of animals were dispatched in the area (Figure 2). If these animals had been killed elsewhere, it would not have been practical to transport the heavy carcasses back to camp. Bones with little food value, such as vertebra, would have been abandoned at the kill location. This is a pattern observed among the Nunamiut by Binford(1978), and is also the one documented at Copper Inuit muskox kill-sites that occur along the Thomsen drainage.

Other kinds of faunal information attest to the idea that some subsistence activities, such as marrow and/or grease extraction, and bird utilization, were family as opposed to communal oriented practices. This is evidenced by the fact that

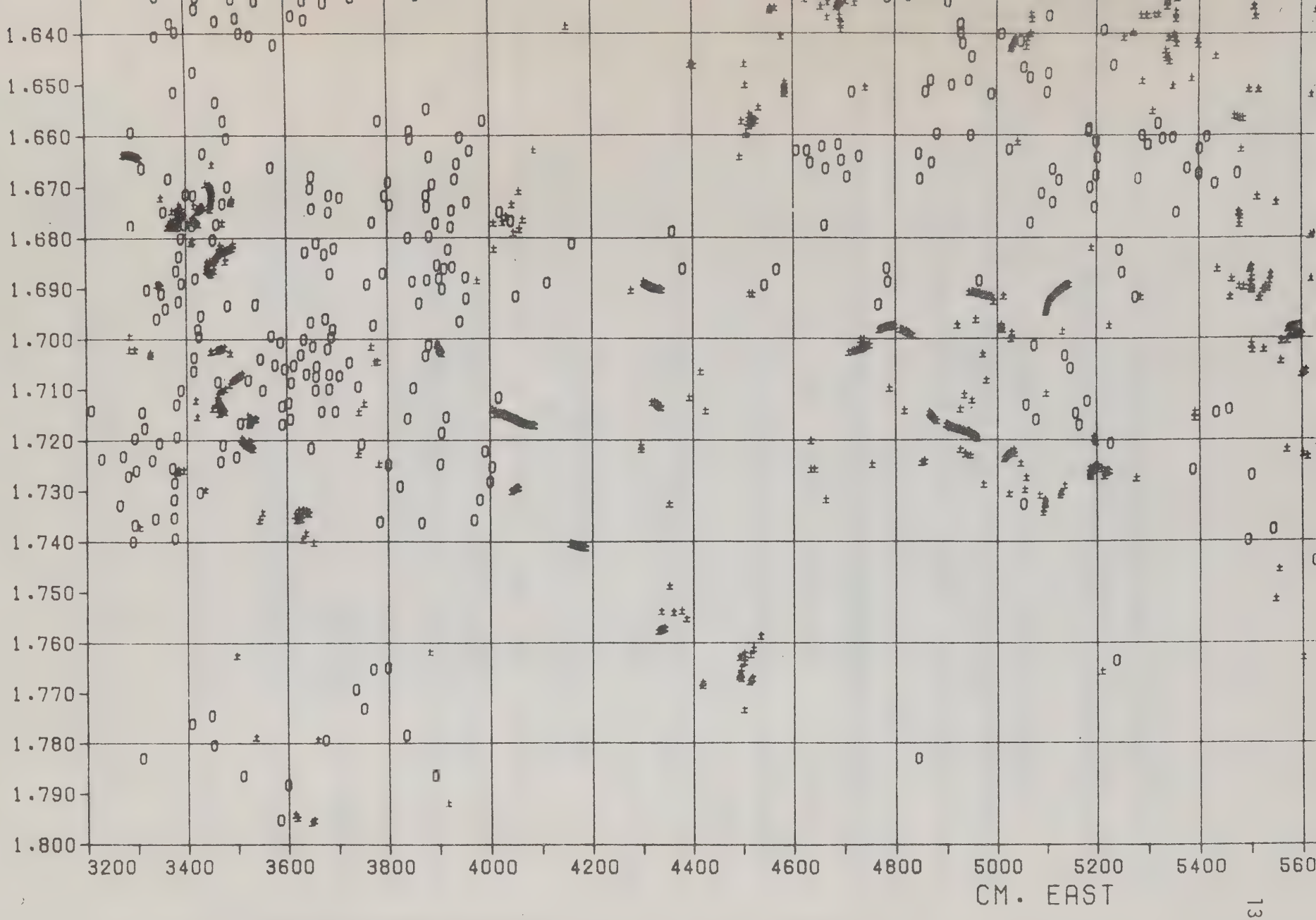


Fig. 2 Articulated muskox vertebral columns at southern end of BPW-29.

muskox long bone fragments and bird bones occur in discrete concentrations near individual stone tent-rings.

In conclusion then, on-going research is underway to document how Victoria Copper Inuit utilized wildlife resources on Banks island during visits to Mercy Bay. A part of this examination has required rethinking several basic assumptions underlying archaeological models of hunter and gatherer settlement and subsistence. Lastly, the use of sophisticated data manipulation techniques in conjunction with an integrated approach to faunal analysis is providing insights into the utilization of wildlife resources by Copper Inuit at the inter and intra-site level.

ACKOWLEDGMENTS

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